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Climate and its changes: a cultural appraisal

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Geographers and Geography has long been acquainted with the idea of climate. For much of the last century, climatology was one of the canonical sub-fields of physical geography and interactions between climate and the human world have proved fruitful sites of geographical inquiry. Although much contemporary scholarship and applied science is concerned with the idea of climate *change*, I believe there is important work still to be done on enriching the idea of climate. The argument put forward in this essay is that climate – as it is imagined and acted upon – needs to be understood, first and foremost, culturally. Rather than framing climate as an interconnected global physical system or as a statistical artefact of weather measurements, climate should be understood equally as an idea that takes shape *in* cultures and can therefore be changed *by* cultures. Climate has a cultural history, which is interwoven with its physical history. It is a history which forms the substrate out of which today's beliefs, claims and disputes about climate change emerge. This essay develops two core arguments. First, climate can be understood culturally, as an idea that humans use to stabilise relationships between weather and their patterned lives. In its various manifestations around the world, the idea of climate enables humans to live with their weather through a widening and changing range of cultural resources, practices, artefacts and rituals. Second, I argue that such a cultural understanding of climate alters the way the contemporary idea of climate change should be conceived; not primarily as a physical process which must be stopped, but as the latest stage in the cultural evolution of the idea of climate.

Key words climate; culture; weather; climate change; ideas

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Introduction

Climate is an enduring idea of the human mind and also a powerful one; and, like any interesting word, it defies easy definition. It is an idea with which geographers and Geography have long been acquainted (see Hare 1966; Barry 2013). The idea of climate today is most commonly associated with the discourse of climate change and its scientific, political, economic, religious, social and ethical dimensions. I have written about these in *Why we disagree about climate change* (Hulme 2009), but before we can understand the cultural politics of climate *change*, I believe we need a richer understanding of the idea of climate itself. My argument put forward in this essay is that climate – as it is imagined and acted upon – needs to be understood, first and foremost, culturally. Taking my cue from Agnew (2014), rather than simply constructing a genealogy of the idea of climate – although I offer some thoughts about this – I am more interested in offering a perspective on climate which is relevant and tuned to the contemporary moment. I offer no 'essential' meaning of climate, but suggest that the idea continues to evolve as it fulfils its function of stabilising relations between weather and human culture.

The relationships between climate and culture appear everywhere in daily life; for example in dress codes, in modes of prediction, in social memories of past climatic extremes, in emotional moods, in technologies of adaptation, in fiction, in narratives of blame. Many of these relationships have been written about, but in disparate texts and journals, fragmented across many different academic disciplines. A coherent literature which treats the rich interactions between climate and culture in a systematic way is lacking. The number and scope of monographs and reference texts offering a synoptic view of climate and culture is rather limited, and some of them obscure. Monographs by Boia (2005), Behringer (2010), Leduc (2010) and, in Japanese, Tetsuro (1988/1935) are noteworthy exceptions, as are the edited collections of Strauss and Orlove (2003), Crate and Nuttall (2009), Dove (2014) and, in German, Welzer *et al*. (2010).

Climate is an old idea, but also a versatile idea which retains tremendous power and utility (Carey 2012); indeed, it continues to acquire new powers (Hulme 2011). Whereas we can imagine an unbroken sequence of moment-by-moment weather on the Earth predating humans, the idea of climate was invented in the

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human mind. Perhaps the Greeks were the first to leave an articulate account of climate – *klima* as it was linguistically formed – but they would not have been the first people to seek to make sense of the incessant flow of atmospheric phenomena to which all sentient life is exposed. The idea of climate was a way of ordering an unruly (weather) world. For the Greeks, by closely associating climate with latitude or solar inclination, *klima* offered an explanatory framework for human diversity and a moral guide for navigation. Climate worked both as index and as agency, as James Fleming and Vladimir Jankovic convincingly argue (Fleming and Jankovic 2011). As *index*, climate is used to describe the accumulated patterns of weather in places; as *agent*, climate is used as explanation for a wide range of physical and human outcomes. This dual function of climate has recurred throughout human cultural history and it works too in contemporary discourses about climate change, as I have shown elsewhere (Hulme 2008).

The distinction between climate as index and climate as agent is important for understanding the power of climate in cultural life. It is also important for appreciating both the imaginative and material manifestations of climate. *Ideas* about climate are always situated in a time and in a place. As history gets rewritten and geography gets reshaped, ideas of climate also change (Heymann 2010; cf. Agnew 2014). The *physical attributes* of climate are also diverse and variable. Climates change physically – as we are now only too well aware – but climates also change ideologically. What climate means to different people in different places in different eras is not stable. 'Human beings live culturally', as the anthropologist Mary Douglas remarked. But one might also say that human beings live *in* climates – amidst the particular fluxes of weather that they encounter in different places, visceral experiences which are interpreted through their imaginative worlds. If culture is concerned with how human meaning, symbolism and practice take on substantive and material forms, then studying climate through culture is likely to be a fruitful activity.

Central to the structuring of my thinking are the twin disciplines of geography and history, with their respective emphases on place and time. Also insinuating its way into this essay is the recognition of different modes of knowing climate – through personal encounter, through cultural myth, through scientific practice, through creative expression. I try not to give pre-eminence to any one of these modes of knowing, instead offering an argument that there is more to contemporary anxieties about the future of climate than can be captured and expressed through scientific method alone.

What is climate, what is culture?

It is difficult to formalise adequately the ideas of either climate or culture. There are of course conventional definitions for such concepts and it is worth repeating some of them here. The scientific definition of climate usually starts with something like the official wording used by the World Meteorological Organisation (WMO): climate is '… a statistical description in terms of the mean and variability of relevant meteorological quantities over a period of time ranging from months to thousands or millions of years'. This description conventionally relies upon 30 years of weather data – although Arguez and Vose (2011) challenge this convention. Or climate might be understood in a more general scientific sense as a description of the state and dynamics of the physical planetary system which consists of:

> … five major components: the atmosphere, the hydrosphere, the cryosphere, the lithosphere and the biosphere, and the interactions between them. The climate system evolves in time under the influence of its own internal dynamics and because of external forcings such as volcanic eruptions, solar variations and anthropogenic forcings.
>
> IPCC (2013, 1451)

The limitations of these definitions of climate will become apparent.

We might do something similar for the idea of culture. For the anthropologist Clifford Geertz, culture as '… an historically transmitted pattern of meaning embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men [sic] communicate, perpetuate and develop their knowledge about and attitudes towards life' (Geertz 1973, 89). Culture, then, just like climate, is hard to see and harder to measure: 'We can never expect to encounter culture "on the ground"' (Ingold 1994, 330), just as no-one has ever 'seen' climate. Instead:

> what we find are people whose lives take them on a journey through space and time in environments which seem to them to be full of significance, who use both words and material artefacts to get things done and to communicate with other, and who, in their talk, endlessly spin metaphors so as to weave labyrinthine and ever-expanding networks of symbolic equivalence.
>
> Ingold (1994, 330)

For Ingold, as for Mary Douglas before him, it is safer to say that people live culturally rather than they live in cultures.

My opening contention is that such definitions do not do justice to the deep material and symbolic interactions which occur between weather and cultures in places, interactions which, as I will suggest, are central to the idea of climate. They too easily maintain a false separation between a physical world (to be understood

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through scientific inquiry) and an imaginative one (to be understood through narratives or practices of meaning). Such a distinction maps easily onto the nature–culture dualism engrained in much western thought and practice, and which has been subject to extensive scholarly deconstruction over recent decades (e.g. Latour 1993; Castree 2013; Descola 2013).

Contrary to such a separatist position, I want to suggest a different way of approaching the idea of climate which requires us, first, to think more directly about weather. A standard dictionary definition of weather would be '… a description of the state of the atmosphere with respect to wind, temperature, cloudiness, moisture, pressure, etc.' It is such instantaneous meteorological conditions which, measured objectively and statistically averaged over a period of time, generate the conventional definition of climate offered above. But climate is *not* weather. Weather has an immediacy and evanescence that climate does not have. Weather is constantly in flux; it is always both passing away and in renewal. Weather describes the instantaneous atmospheric conditions which sentient creatures sense and in which they live, move and have their being. Weather *can* be seen and felt. The Japanese philosopher Watsuri Tetsuro captures this sense in his book *Climate and culture*: *a philosophical study*:

> A cold wind may be experienced as a mountain blast or the cold dry wind that sweeps through Tokyo at the end of winter. The spring breeze may be one which blows off cherry blossoms or which caresses the waves … As we find our gladdened or pained selves in a wind that scatters the cherry blossoms, so do we apprehend our wilting selves in the very heat of summer that scorches down on plants and trees in a spell of dry weather.
>
> Tetsuro (1988/1935, 5)

It is the sensory experience of weather that conditions cultural responses to this human dwelling *in* the atmosphere, whether these be celebratory rituals, material technologies, collective memories, social practices, and so on. We design clothes to withstand cold and buildings to withstand wind; we celebrate the coming of the cherry blossom and the onset of the monsoon; we designate weather prophets to fore-cast (e.g. Anderson 2005; Fine 2007). These cultural artefacts, moods and practices, inspired by diverse experiences of weather – benign or threatening – give shape and meaning to human lives. They are what De Vet (2014) calls 'weather ways': the variations that occur between repeated practices as individuals adjust culturally to the weather. Human beings live culturally with their weather; indeed, they can *only* live culturally with their weather.

With this understanding of weather and its cultural associations it is now possible to offer an understanding of climate beyond that offered by the WMO and climate scientists. I propose that climate be understood as an idea which mediates between the human experience of ephemeral weather and the cultural ways of living which are animated by this experience. The idea of climate introduces a sense of stability or normality into what otherwise would be too chaotic and disturbing an experience of unruly and unpredictable weather. The weather humans experience often fails to meet their expectations. (In the words of the popular aphorism, 'climate is what we expect, but weather is what we get'). But the fact that we do *have* expectations is due to the idea of climate: 'Climate is the ordinary man's [sic] expectation of weather … there is a limit to the indignities that the weather can put upon him, and he can predict what clothes he will need for each month of the year' (Hare 1966, 99–100). Holding on to climate as a normalising idea offers humans a certain sense of security; it allows them to 'put weather in its place' so to speak. Or as historian of science Lorraine Daston explains in her essay exploring the boundaries of nature, '… without well-founded expectations, the world of causes and promises falls apart' (Daston 2010, 32).

If then, as phenomenologist Julien Knebusch explains, '… climate refers to a cultural relationship established progressively between human beings and weather' (Knebusch 2008, 246), the idea of climate should be understood as performing important psychological and cultural functions. Climate offers a way of navigating between the human experience of a constantly changing atmosphere and its attendant insecurities, and the need to live with a sense of stability and regularity. This is what Nico Stehr refers to as 'trust in climate' (Stehr 1997). We look to our idea of climate to offer an ordered container – a linguistic, sensory or numerical repertoire – through which to tame and interpret the unsettling arbitrariness of the restless weather. This container creates Daston's necessary orderliness. Climate *may* be defined according to the aggregated statistics of weather in places (the WMO) or as a scientific description of an interacting physical system (the IPCC). Climate may also be apprehended more intuitively, as a tacit idea held in the human mind or in social memory of what the weather of a place 'should be' at a certain time of year. But however defined, formally or tacitly, it is our *sense* of climate that establishes certain expectations about the atmosphere's performance. The idea of climate cultivates the possibility of a stable psychological life and of meaningful human action in the world. Put simply, climate allows humans to live culturally with their weather.

Returning to the ideas of climate and culture we now see that something of great significance is lost to both ideas – climate and culture equally – if they are not understood in close relation to each other. To adopt a term from sociology we can say that climate and culture exist as a *dyad*, two things of a similar kind but existing

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only in relationship. A husband and wife exist as a dyad, the two-note chord in music is a dyad and in biology DNA sequences which are inverted repeats of each other display what is called dyadic symmetry. The *dyadic* communication between climate and culture, we might then say, is a necessary part of understanding the idea of either climate or culture. Climates therefore become cultured through symbolic interpretations ('nature natured'; following Descola 2013); and through cultures humans become acclimatised to the physicality of weather ('nature naturing').

We can follow this dyadic relationship between climate and culture if we first turn to the etymology of the word climate – originally in Greek, *klima*. For Greek thinkers such as Aristotle, Hipparchus and Strabo, *klimata* were understood in relation to both astronomy and human living. The five climatic zones favoured by Aristotle, later enlarged to seven by Posidonius in the first century BCE, were related to the changing intensities of solar radiation falling on the Earth's surface which had obvious ramifications for the temperature of different latitudinal regions. But these climates were interpreted through the different forms of human life they could imaginatively accommodate. In the Greek mind the idea of climate brought order to the otherwise formless relationship between weather and culture. For example, for Aristotle the torrid and frigid zones *must* be uninhabitable since he understood that the extreme heat and cold prohibited the flourishing of biological and cultural life. Centuries later, still working within a Greek climatic scheme, St Augustine offered a theological argument for an uninhabited Southern Hemisphere temperate clime (in contrast to the habitually favourable Northern temperature zone). God would not create a populated region, Augustine reasoned, even if climatically favourable, which could not be accessed across the intervening torrid zone by the Apostles carrying the salvic Gospel of Christ (Martin 2006). To speak of climate was to speak of human life and culture; to speak of human cultural flourishing was to speak of climate.

This dyadic relationship can also be seen in the way in which non-western societies today continue to understand their world – their environment, milieu or surroundings in the broadest sense. In many such cultures the English word 'climate' has no corresponding translation into the vernacular. Thus the Inuit word *Sila*, or the Marshallese term *mejatoto*, are the closest one can get in these Arctic and Pacific cultures to the European idea of climate. And yet in both languages these words connote a much broader set of interrelations between the material and the relational than the conventional scientific definitions of climate. The manifestation of *Sila* thus encompasses:

> the Sun's solar winds and spots, the Earth's orbital cycles, oceans and atmosphere … air masses and ocean circulations that redistribute heat and moisture at their different rates, ice and regional topography, the breath of plants and animals, and the … metabolism of industrial societies.
>
> Leduc (2007, 248–9)

And for Marshall Islanders in the Pacific *mejatoto* 'is not so much 'climate/weather' as [it is] 'environment' in the widest possible sense, or 'cosmos': the whole scheme of things, including both what Westerners would call nature and what Westerners would call culture' (Rudiak-Gould 2012, 49). In such languages weather and culture do not exist as isolated ideas, but are bound together through a wider cosmography expressed in language, even if not through the Greek word *klima*. And it is through language that humans understand the world and construct its meaning.

Beyond the examples above which are drawn from classical and non-western traditions there is a third way to illustrate the dyad of climate–culture, one that perhaps has greater purchase in contemporary western thought. This is to understand how climate and culture come together and find joint expression in the idea of landscape. Inspired by the ideas of Carl Sauer, geographers have long understood landscapes as places where physical process and cultural practice combine to establish for the dweller in, or perceiver of, landscape a meaningful account of place and life. Landscape, described by cultural geographer Denis Cosgrove '… is a way of seeing, a composition and [a] structuring of the world …' (Cosgrove 1985, 55). This line of thought is developed by Brace and Geoghegan (2011) in their argument for climate to be understood primarily in a relational context. Understanding the idea of climate through landscape allows for a "mingling' of place, personal history, daily life, culture and values' (Brace and Geoghegan 2011, 289). Thinking of how weather and culture work together to fashion a landscape then leads to a much richer and holistic definition of climate as 'a multidimensional phenomenon in which are combined the contributions of nature, culture, history and geography, but also the imaginary and the symbolic' (Knebusch 2008, 245).

Now to return to the conventional definitions of climate and culture with which I started. These definitions may have value in allowing science to work on understanding the physicality of weather and climate and for cultural studies to proceed through studying symbolic forms of meaning. They impose a particular division on the world – presumably convenient for our intellectual imagination – and therefore on our analytical capabilities. But such definitions also carry forward this division into human acting and doing. We therefore proceed too readily to 'act on climate' without regard for its cultural attachments and meanings (Jasanoff 2010); we pursue cultural innovations without regard for their

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'weathering' properties or for their consequences for the physical processes of weather-making (Flannery 2006). Working with such conventional, but partial, definitions means that we fail to be attuned to the many ways in which weather and cultures are mutually shaping and changing each other. It is this interaction that I suggest is captured by the idea of climate.

Changing cultures, changing climates

In the previous section I have suggested how the idea of climate functions to stabilise cultural relationships between weather and humans. Climate performs this function whether defined formally through statistics and science (i.e. approached through studying the physicality of the atmosphere) or tacitly through the human senses and imagination (i.e. approached through studying culture).

But there is something else important to notice: neither the atmosphere nor human cultures are static. With regard to the atmosphere it is not just that the succession of weather in a place is in constant flux; the restless atmosphere, or what I call here the 'primary changeability' of weather. There are also systemic multi-scale physical perturbations that alter the dynamics of this meteorological hyperactivity. (And some, but not all, of these perturbations emerge from human cultural activity, of which more below). The consequence of these perturbations to the climate system is traditionally described as *climatic* change, but here I will call it the 'secondary changeability' of weather. And cultures, too, are in constant flux, 'one of the hard and fast rules of cultural anthropology' (Strauss 2012, 371). In their material expression, cultures are always responding to new physical events, emergent technologies, original ideas and fresh human encounters. But what is regarded as *constituting* culture also changes. Whether understood as human traditions or behaviours, as structures of symbolic meaning or as practices situated in relational contexts, '… scholars have adapted their notions of culture to suit the dominant concerns of the day' (Ingold 1994, 329).

So even if the weather was quasi-stable in terms of its 'secondary changeability' (which it never can be) then climates would still change because cultures change; and even if cultures were static (which they never can be) then climates would still change because weather changes. And since in reality weather and culture are both changing and since these changes are occurring over different scales of time and space, 'changes in climate' inevitably take on complex historical and geographical configurations. 'From the very first, climate is historical climate. History and climate in isolation from each other are mere abstractions' (Tetsuro 1988/1935, 10). In this sense, at least, the idea of a singular *global* change in climate must be questioned (see below).

This appreciation of change suggests a paradox. Although climate is an idea that seeks to *stabilise* and bring order to cultural relationships between humans and their weather, such stability is a chimera. Climates can never be stable, whether we think of them physically (as derivations of weather) or imaginatively (as constructions of culture). Or to put this differently: the stability that the idea of climate brings to human life is at best an aspirational stability, an ordering concept which is under constant negotiation between two entities themselves in constant states of change. Knebusch recognises this when he says that '… from a scientific point of view climate is probably a 'myth' because … there is no such thing as a stability of climates' (Knebusch 2008, 244). But it is also true from a cultural perspective. As cultures change so too will their idea of climate, notwithstanding secondary changes in the weather. Climate will be called upon to do new work in new circumstances, to meet the enduring human need for order, security and meaning. The idea of climate can only evolve. What I have called the climate–culture dyad is in a state of continual adjustment. Paradoxically then, the idea of climate is characterised by both stability *and* change. And this seems to be true whether one seeks to understand climate primarily through weather or through culture. This argument carries with it a number of important implications.

Unsettling the idea of climate

First, it decisively undermines the original Greek idea of climate as a description of static and fixed relations, what I describe below as a 'stage 1' understanding of climate. The Greeks understood climate and culture as tightly coupled, but they saw this coupling as an ideal and unchanging state of affairs which brought explanation and order to their world. This static notion of climate persisted in western thought through the Medieval era into the early modern world. But work by Vladimir Jankovic, Eva Horn and Bernard Locher, among many others, has shown how scientific developments, literary texts and political projects in the late eighteenth and early nineteenth centuries began to undermine in the human imagination the idea of an unchanging climate. Although the word 'climate' had first been used in the English language around 1400 (Barry 2013), the first book in English to use climate in its title appeared only in 1806 and was called, *The climate of Great Britain, or remarks on the change it has undergone particularly within the last fifty years* (Williams 1806). Coincidentally or not, this change in the western idea of climate (to what I call a 'stage 2' understanding of climate) occurred around the same time that today's scientists suggest that the scale of human industrial activities first began to leave their mark, although then still invisibly, on physical atmospheric processes (what

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150 years later would lead to a 'stage 3' understanding of climate). The discovery of 'deep time' in geology and the realisation of great Ice Ages in the past (Woodward 2014) unhinged the Greek conception of an unchanging climate. As argued by Locher and Fressoz (2012, 581):

> For more than a century, from the mid-eighteenth century to the last thirty years of the nineteenth century, Western societies conceived of their relationship to the environment and their responsibility for the transformation of both nature and their own way of life in terms of the climate.

The disturbance to European weather in 1816, caused by the eruption of the Tambora volcano the previous year, nicely illustrates how the idea of climate adjusts, culturally, to challenging new atmospheric conditions. The 'secondary changeability' in the weather generated by Tambora's worldwide clouds of particulate matter, provoked new cultural imaginaries in Europe which brought forth new stories of human agency in nature (Bodenmann *et al*. 2011). Shifting cultural relationships between humans and their weather were accommodated and stabilised by rearranging the idea of climate. One can see similar adjustments at work in the cultural responses to the eccentric European weather generated by the Laki volcanic eruption in Iceland in 1783 (Grattan and Brayshay 1995).

Undermining climate stability

Second, understanding climate in the way I have suggested challenges the idea, current in some circles today, that a stable (global) climate is a securable public good. There remains strong political rhetoric in favour of defusing current climatic anxieties by 'stabilising climate' and bringing it under human control (Hulme 2014a), the global climate of the late twenty-first century to be stabilised at no more than 2 °C (or even 1.5 °C) warmer than the 'pre-industrial' nineteenth century. Lucien Boia in *The weather in the imagination* and Locher and Fressoz (2012) have written about the enduring human anxieties associated with a disordered climate, 'The history of humanity is characterised by an endemic anxiety … it is as if something or someone else is remorselessly trying to sabotage the world's driving force – and particularly its climate' (Boia 2005, 149). Such anxiety is manifest today for example in the popular descriptions of climate change as 'weather weirding' or 'climate chaos'. Quoting again from Daston's essay, 'Of all nightmares that bedevil the collective human imagination, that of chaos is the most terrifying' (Daston 2010, 32); this bedevilment arises as much from a sense of a disordered nature as from an anarchical society.

But if climate is understand as explained above then a stable climate – most of all a stable *global* climate – is an illusion. The idea of climate I am offering is a co-construction between the physicality of weather and the ideas and practices of human cultures which feel its force. And the relationship between these changing material and imaginative worlds which humans inhabit is never stable. Nor is this relationship the same in different places. Even if the 'secondary changeability' of physical weather *could* be stabilised through orchestrated collective actions, the cultural understandings and expressions of climate would continue to change. This cultural malleability of climate is what I explored in my 2008 essay about the discourses of climate catastrophe, concluding that:

> … New ideas, ideologies and powers will emerge and shape new discourses of climate, discourses located in the new dominant cultural movements of the future. Alignments between ideologies, technologies and cultural movements can change more rapidly than can the physical climate.
>
> Hulme (2008, 14)

The human quest to bring order to the world, explained by Daston, can only be achieved by recognising the ultimate unachievability of climatic stability. The idea of climate brings order to human life only in so far that it continually accommodates change in its constituent elements of weather and culture.

Reassessing causation

A third consequence of approaching climate as an idea that mediates between weather and culture is to intervene in longstanding debates about determinism and the agency of climate. As explained by Fleming and Jankovic (2011), climate has long carried a double meaning: as a descriptive index of the long-term condition of the atmosphere's weather in a place (as in 'the climate of this region is hot and humid'), but also as a forceful agent which brings about material outcomes in the world (as in 'tropical climates inhibit innovation and economic vitality'). Through the latter meaning climate has been granted power to change worlds: political and social worlds, as much as physical and ecological ones (Livingstone 1991). But if the idea of climate is approached as I suggest above then we can recognise more complicated modes of agency at work. Yes, weather has agency – for example it has material effects on the human body and social practices. And yet humans, too, have agency by conditioning and ameliorating these effects through cultural responses to their weather. These responses are often referred to as acclimatisation or adaptation. The idea of climate then mediates between these two forms of agency, recognising both but holding them in tension. It is not the case that climate *determines* any particular human outcome. It is rather that human outcomes – with respect to landscape,

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design, technology, character, mobility, etc. – emerge from the interplay between atmospheric materiality and the actions of the human mind.

This is what Tetsuro (1988/1935, 16) means by 'this climatic character that we need to study and discover'; but the climatic character of cultures as much as of individuals. Tetsuro goes on to argue that climates are not merely natural phenomenon – for example, 'the abstract desert' as revealed by the hygrometer – but that climates become ways of life; cultures in other words. For Tetsuro the desert is a socio-historical climatic phenomenon and the 'desert man' is an archetype. Humans have no option but to live climatically, just as they have no option but to live culturally. Both culture and climate exert a pull upon our lives, the latter as recognised in Alexander von Humboldt's nineteenth century relational definition of climate: namely, climate is all that is in the physical atmosphere that is affective on the physiology and the psychology of humans. This dyadic pull on our lives too is pursued by Thomas Macho in his essay 'Making weather' when he draws parallels between the way that climate and culture both offer the condition and the outcome of human actions:

> Obviously the concept of climate shares with the concept of culture the ambivalence of effecting and enduring. Culture may be what humans create by working on nature, but it may also be what is imposed/enforced on individuals and what is not voluntarily chosen: historical, geographic-climatic, linguistic or political-religious conditions. Climate and culture alike can be seen as both fate and project.
>
> Macho (2008, 132)[1]

Human beings are shaped by climates and cultures not of their choosing and yet human projects and innovations decisively alter both their climatic and their cultural environments. Cultures develop a certain climatic character, one might say, but a character limited by the cultural interpretation of a society's physical climate.

In dyadic relationships the idea of symmetry is important, true also for climate–culture. Climate and culture act symmetrically upon each other, but with outcomes which reveal the unequal distributions of power, wealth and gendered agency in the world. The 'impacts' of climate or climate change are therefore contingent and emergent and hence always political; they are to be fashioned more than they are to be predicted. Conditioning, or 'cultivating' (see Kirsch 2014), climate in this way allows causation to flow from weather to culture and from culture to weather; the language of a cultivated climate allows us to express this two-way agency. The symmetry in the climate–culture dyad also overcomes the epistemological tension in the argument explored by Rudiak-Gould (2013) about whether or not climate change can be 'seen' by humans. Rudiak-Gould resolves this tension by revealing practices of 'constructed visibilism', where agency is distributed between weather and culture (see also below). This idea of symmetrical agency is also implicit in Nigel Clark's work *Inhuman nature* (Clark 2011). He argues against the human exceptionalism implicit in the idea of the Anthropocene – that humans have newly exceptional powers over nature – whilst at the same time resisting the old determinisms of nature's dominion over the human.

Rethinking climate change

Fourthly, and finally, I suggest that this approach to thinking about climate helps us to understand the contemporary idea of climate change in a different way. But before exploring this it is perhaps helpful to draw out more explicitly the three – admittedly caricatured – historical stages of the evolving story of climate that I am proposing.

The first stage was the ancient Greek idea through which the climate–culture dyad existed in a stable and static form, suggesting fixed relations between the meteorology of the atmosphere and the cultural conditions of human life. Only minor modifications to the weather were possible – for example, through draining swamps or clearing forests – while the reassuring idea of an unchanging climate and its cultural possibilities brought a comforting, if chauvinistic, order to the Greek world.

The second stage in this story developed when the modern west realised that their idea of climate, inherited from the Greeks, needed to be rethought. Thus climate became a more dynamic idea, driven on the one hand by the discovery of the 'secondary changeability' of weather (e.g. the extra-human agency of the Ice Ages) and on the other by changing cultural conditions and imaginaries (e.g. Romanticism and Republicanism). Works by Grove (1995), Fleming (2005), Jankovic (2000), Golinski (2007) and Locher and Fressoz (2012) have shown the numerous ways in which the idea of climate was transformed during this period as part of the wider cultural shifts occurring in European life and colonisation. The climate–culture dyad has been in flux throughout the modern era.

The story of climate then entered a third stage in the late twentieth century, characterised by the additional and novel way in which human agency enters into the dyad. Climates change not only through changes in cultural imaginaries interacting with naturally induced changes in weather ('secondary changeability'). But climates now also change because human ways of life – and their material products and emanations – interact with natural processes to further perturb the workings of the atmosphere (what I call 'amplified secondary changeability' in the weather). Humans are remaking *both* the imaginative *and* the physical dimensions of climate, even if in ultimately indeterminate and

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unpredictable ways. It is therefore doubly problematic to attempt to isolate anthropogenic climate change as a distinct physical phenomenon using the reductionist tools of science (Hulme 2014b).

Identifying these three historical stages in (mostly) western thinking about climate makes it easier to see what is new and not so new about the contemporary idea of climate change. The continuity between 'stage 2' and 'stage 3' is the recognition of the ongoing cultural work that necessarily gives form and shape to the idea of climate; as cultures change so too will the idea of climate. What is novel in 'stage 3' understanding of climate, however, is that these cultural influences are now working on climate both imaginatively *and* materially. The 'secondary changeability' of weather – now amplified through the physical perturbations to the climate system emanating from humanity's collective life, what novelist Ian McEwan has referred to as 'the hot breath of our civilisation' – has become an integral part of the climate–culture dyad.

What has been 'discovered' then in recent decades (cf. Spencer Weart's *The discovery of global warming*; Weart 2003) is this additional dimension to the coupling between climates and cultures. Through theorising, observation and experimentation, scientific inquiry has revealed the substantive and novel effects of human agency on the physics of the atmosphere and Earth system. Cultures (now) shape climates materially, as they also do (always have done) ideationally. Taken on its own this scientific discovery of human influence on the 'secondary changeability' of weather is best described as climatic change, which was indeed the favoured terminology for much of the 1960s and 1970s (e.g. Hare 1966; and the scientific journal titled *Climatic Change* founded in 1977). But during the 1980s and 1990s a gradual drift occurred away from climatic change (i.e. an indexical description of change) to the now preferred terminology of 'climate change' (i.e. a noun, an agent of change). This reveals the new 'stage 3' understanding of the idea of climate.

Since the practice of science takes place 'in a specific cultural milieu with its own set of values, assumptions, and power dynamics' (Roncoli *et al*. 2009, 98), the fact that it is scientific inquiry that has brought about this change in thinking is no less a cultural achievement than earlier changes to the idea of climate realised through the human imagination. Just as the cultural imagination works on the idea of climate, the idea of climate change – now as something more explicitly human-formed – changes the possibilities of the cultural imagination. The climate–culture dyad continues to evolve. This symbiosis is clearly recognised by Adger and colleagues in the context of adaptation:

> Culture is no less central to understanding and implementing [climate] adaptation: the identification of risks, decisions about responses, and means of implementation are all mediated by culture. Cultures are dynamic and reflexive and so are in turn shaped by the idea of climate change. Hence culture, and its analysis, is central to understanding the causes and meaning of, and human responses to climate change.
>
> Adger *et al*. (2013, 1)

This too is why anthropologist Rudiak-Gould calls upon diverse forms of cultural life and practice to resolve the politically-charged argument he identifies between climate change 'visibilists' and 'invisibilists' (Rudiak-Gould 2013). Global climate change cannot simply or unambiguously be 'seen' by the unaided eye, whereas to claim that the *only* cultural practice that can make this invisible phenomenon visible is science is to lend too much authority to this one form of cultural knowledge. This would be the asymmetry in nature–culture relations rejected by Descola (2013). Instead, Rudiak-Gould argues for what he calls 'constructed visibilism', in which many different forms of cultural work – visual art, memory, myth, performance, fiction, song, etc. – are needed to make climate change real or believable. For him this is an attractive position since it offers '… a compromise between an anti-intellectual visibilism and an elitist, undemocratic invisibilism' (Rudiak-Gould 2013, 129). This too is the position of Roncoli *et al*. (2009), revealed through their four axioms that exemplify the ways that different cultures engage their world through the idea of climate change:

> … how people perceive climate change through cultural lenses ('perception'); how people comprehend what they see based on their mental models and social locations ('knowledge'); how they give value to what they know in terms of shared meanings ('valuation'); and how they respond, individually and collectively, on the basis of these meanings and values ('response').
>
> Roncoli et al. (2009, 88)

The idea of climate as 'climate change' is sustained through the interweaving of culture and weather, both now understood as deeply interpenetrative. We might then say that climate change, as constructed visibilism, is 'a cultural fact' (paraphrasing Appadurai 2013). As an ever-widening range of social actors have appropriated the scientific discourse of anthropogenic climate change for their own purposes, so the cultural meanings and expressions of this new way of apprehending the old idea of climate have proliferated. There is little doubt that compared with 30 years ago the idea of climate in western cultures (now as climate change) provokes a wider range of emotional, aesthetic and spiritual expressions. All aspects of human life are

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now analysed or represented in relation to climate: gender, violence, literature, security, architecture, the imagination, football, tourism, spirituality, ethics, and so on. Like a kaleidoscope, the idea of climate is now refracted through photography, cartoons, poetry, music, literature, theatre, dance, religious practice, architecture and educational curricula.

All human practices and disputes can now be expressed through the language of climate change, which has become a new medium through which human life is lived. And this does seem a suitable expansion of human thinking and acting given the convergence between modern and non-modern thought about the deep interpenetration of weather and culture. To call upon the older metaphorical usage of the word 'climate' in the English language we might say that we now live in a climate of climate change. So it is that political disputes about development aid, landscape aesthetics, child-rearing, trade tariffs, theology, patents, extreme weather, justice, taxation, even democracy itself, find themselves inescapably caught up in the argumentative spaces and linguistic expressions of climate change. As Renate Tyszczuk explains:

> The distinctive features of climate change … affect every aspect of human lives, politics and culture. Climate change is too here, too there, too everywhere, too weird, too much, too big, too everything. Climate change is not a story that can be told in itself, but rather, it is now the condition for any story that might be told about cities, or our inhabitation of this fractious planet.
>
> Tyszczuk (2014, 47)

Climate change also engages our embrace of the future, a future that is always represented through diverse human symbolic and meaningful practices. In the memorable phrasing of Arjun Appadurai's eponymous book (Appadurai 2013), the future is a cultural fact and one that has become increasingly climate-shaped in recent decades (Hulme 2011).

Humans live climatically as much as they live culturally. Rather than thinking that changes in physical climate can be stopped by human effort and ingenuity, we should see climate change as the latest framing of the ancient idea of climate. The purpose of this new framing is not to produce a stable physical climate, which remains a chimera. This new framing leads to a re-negotiation of cultural relationships between humans and their changing weather. That it is now 'climate change' that performs this work, rather than 'stage 1' or 'stage 2' ideas of climate, reflects the significance of the human agency now at work. Responding to climate change is simply the latest manifestation of the human search for order in nature–society relations, a search which is inescapably political.

Conclusion

This essay started from the premise that the idea of climate has both material and cultural underpinnings and that it needs to be understood in this way. It therefore challenges the primacy of a natural science framing of climate and, hence, of the predominantly scientific understanding of (anthropogenic) climate change. For example, the dominance of the assessment reports of the IPCC – within science, scholarship, politics and public debates – too easily promotes the view that climate is to be understood as a planetary system of physically interconnecting processes which can faithfully be represented in mathematical models. In this scientific framing, changes in climate and in their human and non-human drivers are to be studied, explained and predicted through scientific theory and method. As a consequence, interpretations of forensic detection and attribution studies using arcane statistics and complex climate model ensembles seem to have become central both to the scientific and the public status of climate change.

But there is another story to be told about climate change, one which starts with the historical and cultural dimensions of the idea of climate. Rather than framing climate as an interconnected global physical system or as a statistical artefact of weather measurements, climate needs to be understood equally as an idea that takes shape *in* cultures and can therefore be changed *by* cultures. Climate has a cultural history, which is interwoven with its physical history. It is a history which forms the substrate out of which contemporary beliefs, claims and disputes about climate change emerge today. It places the contemporary phenomenon and discourse of climate change within a matrix of rich cultural understandings and meanings.

My approach to studying climate therefore extends well beyond the traditional disciplines where climate and culture are studied – respectively climatology and anthropology – even if within these disciplines there are identifiable sub-communities of scholars concerned with their interactions. For example Thornes and McGregor (2003) identify a cultural climatology tradition within geography, while anthropologists such as Todd Sanders refer to 'critical climate change anthropologists' (Sanders 2014). To fully grasp the idea of climate, and by implication I would argue climate change, the insights of anthropology, geography, history, psychology, sociology, theology, history, eco-criticism and philosophy are needed. And with science understood as cultural practice (as in the journal *Science as Culture*), work from social studies of science and science and technology studies (STS) is also needed. This perspective has informed the collection of 90 published articles from the above disciplines which I have brought together in the SAGE Major Reference Work, *Climates and cultures* (Hulme 2015).

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Cultural and historical understandings of the idea of climate and its changes need deepening. I have suggested that the idea of climate works to stabilise cultural relationships between humans and their weather, how the climate–culture dyad readjusts to changes in weather and in culture and how climate change is grasped and represented culturally. Climate change can be understood as a ubiquitous trope through which the material, psychological and cultural agency of the idea of climate is performed in today's world. In this context, climate change should not be understood as a decisive break from the past nor as a unique outcome of modernity. It should be seen as the latest stage in the cultural evolution of the idea of climate, an idea which enables humans to live with their weather through a widening and changing range of cultural resources, practices, artefacts and rituals.

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